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Federal Communications Commission

WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
The Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010	)	WT Docket No. 96-86

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To: The Commission

REPLY COMMENTS OF THE AIR TRAVELERS ASSOCIATION, AMERICAN AIRLINES, THE GENERAL AVIATION MANUFACTURERS ASSOCIATION, OUTREACH, STANFORD UNIVERSITY (THE GPS RESEARCH PROGRAM), THE U.S. GPS INDUSTRY COUNCIL, AND UNITED AIRLINES

The U.S. GPS Industry Council ("the Council"), the Air Travelers Association,[1] American Airlines, the General Aviation Manufacturers Association, Outreach, Stanford University (the GPS Research Program), and United Airlines (collectively referred to as "GPS Commenters"), by counsel and pursuant to Sections 1.415 and 1.419 of the Commission's rules,[2] hereby submit their reply comments in response to the notice of proposed rule making in the above-referenced proceeding.[3/] In their comments, the GPS Commenters raised a number of

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1 The Air Travelers Association represents the flying public.

2 47 C.F.R.§§ 1.415 and 1.419.

3 *See The Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010*, First Report and Order and Third Notice of Proposed Rulemaking, WT Docket No. 96-86 (FCC 98-191) (released September 29, 1998) ("*NPRM*").

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issues with respect to the Commission's proposals for transmitters operating in the public safety spectrum at 794-806 MHz, including a showing that the Commission's proposed emission standards for systems operating in the 794-806 MHz band will result in harmful interference to the GPS frequency band that would end the continuous availability of GPS and the Global Navigation Satellite System ("GLONASS").[4] The continuous availability of GPS is an operational requirement for a broad range of commercial and public safety users.

Of the commenters on the *NPRM* that addressed the impact of the Commission's proposal for 794-806 MHz public safety spectrum on GPS and GLONASS receivers, many recognized the importance of GPS to the technology of navigation, positioning, and time, but went on to express "concern" about the "stringent emission standards" proposed by the Commission for public safety radios in the 794-806 MHz band. In various filings, this "concern" manifested itself either in the notion that the future of the GLONASS is questionable due to the "political and economic difficulties in the former Soviet Union,"[5] or in the claim that the proposed emission standards "will delay the manufacturing of compliant 700 MHz public safety radios and even have the potential to completely negate public safety's ability to utilize this band at any time in the near future."[6]

The only issue here is whether GPS would in fact be protected under the proposal set forth in the *NPRM*. The obligation of the Commission to ensure the protection of safety-of-

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[4] GPS and GLONASS together form the nongeostationary space segment component of the Global Navigation Satellite System ("GNSS") in the 1559-1605 MHz band.

[5] *See, e.g.,* Comments of New York State Technology Enterprise Corporation at 7-8.

[6] See Comments of Motorola, Inc. at 4.

life services from harmful interference is clear and inviolate. Although the comments reflect some consternation on the part of the manufacturers of public safety radio equipment as to the stringency of the standards, and it is apparent that these manufacturers have convinced some of their key customers to weigh in on their behalf with those same concerns, only the GPS Commenters have provided enough substantive detail to enable the Commission to determine whether or not its protection obligation is satisfied under the proposal advanced in the *NPRM*. The answer the GPS Commenters provided is that the proposed standard is not sufficient. They showed that the public safety service uses proposed by Motorola and other commenters at 794-806 MHz would endanger a GPS system that is dynamic, growing, and critical (in both a public safety and an infrastructure context), and that the –70 dBW/MHz out-of-band emission level that is identified as sufficient to protect GPS operations is woefully deficient.

The impact of the Commission's proposal is not, as the GPS Commenters showed, restricted to the portion of the 1559-1610 MHz RNSS band that is used by the Russian GLONASS system. Instead, they noted that under the standard suggested in proposed Section 90.553, a public safety mobile radio operating in the lower end of the 794-806 MHz band would produce harmonics in the RNSS band at a level of -75 dBW -- some 89.5 dB above the GPS signal. They went on to describe how such powerful harmonics landing just outside of the GPS assignment would block reception of the GPS signal or prevent a GPS receiver from tracking, and have an obvious negative effect on pubic safety.[7] They observed that, "[i]n much the same way as a powerful bomb does not require pinpoint accuracy to cause devastation to its intended target, the powerful second harmonic of a 30 Watt mobile transmitter does not have to be right in

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[7] GPS Commenters Comments at 10.

the GPS assignment in order to devastate the operation of GPS."[8] Thus, when commenters such as the Association of Public-Safety Communications Officials-International, Inc. ("APCO") suggest anecdotally that even the "restriction" proposed in the *NPRM* are "largely unnecessary in most of the relevant spectrum,"[9] they are at best misinformed. If nothing else, it is incumbent on the proponents to *prove* at a technical matter that their operations in the 794-806 MHz band would not cause harmful interference to GPS – a showing that the GPS Commenters have demonstrated to be impossible to make.

Although many of the public safety commenters criticize the "stringency" of the Commission's proposed emission limitations, the fact remains that the GPS Commenters have shown that the limitations may not be adequate for scenarios that fail to conform to the one for which the standard was devised – i.e., a single transmitter that is separated by 100 feet and an aircraft fuselage from a victim GPS receiver that is pointing in a different direction. This was the standard developed for application to mobile-satellite service handsets that operate in the band 1610-1626.5 MHz (immediately adjacent to the RNSS band at 1559-1610 MHz). As the GPS Commenters pointed out in their Comments – and as the U.S. GPS Industry Council has been showing in a number of separate Commission proceedings on out-of-band emissions into RNSS over the last year or so – neither the distance nor the shielding assumption applies in any of a number of critical land and marine safety-related applications where mobile GPS receivers and interfering transmitters can be expected to interact. As a result, the unsubstantiated criticisms of

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8 *Id.*

9 *See* APCO Comments at 9.

the Commission's proposed standard that are expressed by APCO and others fail meaningfully to join the real issue of whether the proposed transmitters would protect GPS receivers.

It is not the intent of the GPS Commenters to repeat here all of the compelling showing they made in their initial comments in the instant proceeding. It is, instead, sufficient to point out, by way of contrast, that none of the commenters supporting either the proposed emission limitation for 794-806 MHz public safety radios or the relaxation thereof made any cognizable effort to show how GPS would be protected by such a standard.

The Commission must remain mindful of the facts that millions of people worldwide rely on the stability, continuous availability, and integrity of the GPS service that is provided by the U.S. Government and confirmed in the U.S. Presidential Decision Directive and various statutes, and that the continuous, market-driven evolution of passive receiver technology is premised upon the predictable integrity of the GPS spectrum. For these reasons, for all of the reasons stated in the GPS Commenters' Comments and their foregoing Reply Comments, the Commission must be prepared to impose the most stringent emission limitations for the second

harmonic emissions from mobile equipment in the 794-806 MHz band in order to protect all public safety applications -- land and marine, as well as aviation -- of GPS in the 1559-1605 MHz band.

Respectfully submitted,

THE AIR TRAVELERS ASSOCIATION, AMERICAN AIRLINES, THE GENERAL AVIATION MANUFACTURERS ASSOCIATION, OUTREACH, STANFORD UNIVERSITY (THE GPS RESEARCH PROGRAM), THE U.S. GPS INDUSTRY COUNCIL, AND UNITED AIRLINES

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